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Changes in sea level due to increased fresh water flux from the Arctic

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Additional fresh water input to the northern North Atlantic has different effects on sea level, due to the change in ocean volume, ocean circulation, and density distribution. Here, we force a global ocean-sea ice model with increased melt water run-off from Greenland. We use a fresh water anomaly tracer to distinguish the different contributions to the local sea level change in the model. The resulting sea level changes have a distinct spatial pattern with much larger increases in the north-eastern North Atlantic and the Arctic Ocean than would be expected just from the additional water volume. This result highlights that estimates of century scale sea level changes from glacial melt can not be made without considering the oceanic processes that introduce large regional differences in the response.